Non-Fee Amendment

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Date 10/3/2003 Kevin D. McCarthy
Attorney Reg. No. 35,278

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Yonat

Title: Improved Irrigation Pipelines

Serial No. 10/612,528

Filing Date: July 2, 2003

Examiner: N/A

Claim of Priority Document

Mail Stop Non-Fee Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Enclosed please find a certified copy of the Submission of Claim of Priority for the above referenced matter.

Respectfully submitted,

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This is to certify that annexed hereto is a true copy of the documents as originally deposited with the patent application of which particulars are specified on the first page of the annex.

זאת לתעודה כי רצופים בזה העתקים נכונים של המסמכים שהופקדו לכתחילה עם הבקשה לפטנט לפי הפרטים הרשומים בעמוד הראשון של הנספח.

This 24-07-2003 היום

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THE PATENTS LAW ,5727 - 1967

לשימוש הלשכה
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מספר: Number	150909
תאריך: Date	[illegible]
הוקדם/נדחה Ante\Post-dated	

15026/02A

בקשה לפטנט
Application for Patent

אני, (שם, המבקש, מענו ולגבי גוף מאוגד - מקום התאגדותו)
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בעל אמצאה מכח הדין
Owner, by virtue of the Law

ששמה הוא
(בעברית)
an invention the title of which is
(Hebrew)

מערכת צינורות השקייה מטפטפת משופרת

(באנגלית)
(English)

IMPROVED DRIP IRRIGATION CONDUITS

מבקש בזאת כי ינתן עליה פטנט
hereby apply for a patent to be granted to me in respect thereof.

• בקשת חלוקה - Application of Division	• בקשת פטנט מוסף- Application for Patent Addition
מבקשת פטנט from Application No. מס' Dated מיום	• לבקשה/לפטנט to Patent /Appl. No. מס' 150547 Dated מיום 2.7.02

• יפוי כח: כללי/ ~~מיוחד - רצוף בזה/ עוד יוגש~~
P.O.A.: general/ individual -attached/to be filed later
filed in case 138196 הוגש בענין

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ב"כ המבקשת
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דרישת דין קדימה
Priority Claim

מספר/סימן Number/Mark	תאריך Date	מדינת האגוד Convention Country

היום 24 בחודש יולי שנת 2002
This 24 of July of the year 2002

לשימוש הלשכה
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טופס זה, כשהוא מוטבע בחותם לשכת הפטנטים ומושלם במספר ובתאריך ההגשה, הינו אישור להגשת הבקשה שפרטיה רשומים לעיל.
This form, impressed with the Seal of the Patent Office and indicating the number and date of filling, certifies the filing of the application the particulars of which are set out above.

• מחק את המיותר
Delete whatever is inapplicable

15026/02A

מערכת צינורות השקייה מטפטפת משופרת

IMPROVED DRIP IRRIGATION CONDUITS

IMPROVED DRIP IRRIGATION CONDUITS

Field of the Invention

This is an application for a patent of addition to pending application No. 150547. This invention relates to improved pipelines for drip irrigation, which are protected from the clogging of the bores present therein and from the ingress through said bores of undesired material, particularly growing roots.

Background of the Invention

The use of pipelines which provide irrigation by gradually dispensing water or aqueous solutions to the soil, particularly in the form of drops or at any rate in periodic small quantities, is greatly widespread both in agriculture and in gardens, orchards and the like. Said pipelines merely consist of pipes, having bores formed in their wall thickness along their lengths, by drilling or by other means, such as boring, welding etc., connected to a source of a liquid - water or a solution, generally an aqueous solution - which dispense the liquid through said bores. In many cases, such drip pipelines are laid upon the soil, to feed water or solutions of any desired substances, such as fertilizers, weed killers, pest killers and so forth, to the uppermost layers of the soil. In other cases deeper penetration of the water or solutions is desired, and for this purpose the drip pipelines are laid within the soil at a certain depth from its surface.

In any case, a considerable trouble is caused by the ingress of undesired material into the bores of the drip pipes. The undesired material may be vegetable or mineral. Particularly, roots of vegetation may gradually

grow through the bores of the pipes and clog them, at least to some extent, and may continue to grow within the pipes and reduce the cross-section available for the flow of liquid. Minerals may also be sucked into the pipes because of a temporary reduction of inside pressure. These phenomena reduce the efficiency of the pipeline as a supplier of desired liquid to the soil and often require the replacement of sections therefor. As far as the applicants know, the only means for attempting to prevent the growth of roots of vegetation into the pipes are chemical means. It must be kept in mind that drip pipelines are means for providing to the soil desired liquids, which must be very economical, particularly in view of their great extension, and that complicated and/or expensive improvements would be unacceptable.

It is therefore a purpose of this invention to provide drip pipelines that are protected against the ingress or any undesired material into the bores through which the drip action is carried out.

It is another purpose of this invention to provide means whereby existing drip pipelines may be so protected.

It is a further purpose of this invention to provide means, that are not chemical means, for preventing roots and other vegetable growths from penetrating into the bores of drip pipelines.

It is a still further purpose of this invention to provide drip pipelines the inside of which remains free from foreign materials and allows normal, unimpeded flow of liquids to be dispensed in the soil.

It is a still further purpose of this invention to provide the aforesaid results and advantages regardless of whether the drip pipeline is laid on the soil or within the soil at some depth from the surface.

It is a still further purpose of this invention to achieve the aforesaid purposes with inexpensive means, which do not require complex or difficult operations for their application.

Other purposes and advantages of the invention will appear as the description proceeds.

Improved pipelines achieving the aforesaid purposes aredescribed in copending application No.50547, of the same applicant, the whole contents of which are incorporated herein by reference.

Summary of the Invention

The improved drip pipelines of this invention are characterized by the fact that they comprise a protection at least over the bores through which liquid is dispensed to the soil. The protection is in the form of a layer pervious to water, that is laid at least over said bores. Preferably, the pervious layer is placed over the surface of the segments of the pipeline segments, at least over the surface of the segments wherein a bore or bores have been formed. In copending application No. 150547 said layer is particularly described as being a fabric. It has been found that said layer may be constituted by a metal sleeve placed around the pipelines, at least over the sections thereof comprising bores. Preferably said sleeve is

constituted by a metal wire wound in the form of a helix or spiral and in the following description and claims the word "sleeve" should be so interpreted. It will be understood, and is implicit in this description though not further recalled, that such a spiral sleeve is flexible and could behave like a spring, which facilitates its use and permits it to adapt to bends or even convolutions of the pipeline to which it is applied. Actually, a spring could be used as spiral sleeve in this invention and a spiral sleeve could also be called "spring". A water pervious metal sleeve could be formed otherwise, for instance, it might be constituted by a cylindrical metal plate provided with perforations, but such forms, while included in the invention, are less preferred. A metal spiral sleeve, according to the invention, is pervious to water, because water can pass between adjacent turns of the spiral, but the space between adjacent turns is too small to allow vegetable matter, such as roots, or other undesired matter to pass. The bores are thus protected from clogging. On the other hand, the spacing between adjacent turns of the spiral is such that the spiral sleeve will not undesirably interfere with the delivery of water required for the drip irrigation, and is preferably such that all or nearly all of the water discharged from the bores of the pipeline will also be discharged through said sleeve, viz. that the rate of flow through the sleeve will equal, over a sufficient length of time, the rate of flow through the bores of an unprotected pipeline. The expression "over a sufficient length of time" means that, while a certain amount of water may accumulate between the pipe and the sleeveand some presuure may be created therein, after a certain time the rate of water flow through the sleeve will equal or nearly equal that through the bores.

The preferred pervious layer is a spiral sleeve made of a metal that is resistant to the environment in which it will be placed, over the ground or within the ground as the case may be. In many cases, stainless steel is a satisfactory metal material. The diameter of the sleeve will depend, of course, on the diameter of the pipeline over which it is to be placed. The internal diameter of the sleeve may be equal or nearly equal to the external diameter of the pipeline or it may be larger to any desired extent. The diameter of the metal wire of which the spiral sleeve is made will be such that the wire may be easily wound to the desired spiral diameter, and may generally vary from 1 to 1.5 mm, e.g. 1.2 mm. The distance between adjacent spiral turns may generally be of 1 mm. However the said dimensional parameters will be determined so as to impart to the spiral sleeve the desired permeability to water. As in application No. 150547, the permeability is determined by measuring a first amount of water, which is the amount dripped from a drip irrigation pipe, then applying a sleeve to the pipe and measuring a second amount of water, which is the water filtered through the sleeve. The ratio of the second amount of water to the first can be taken as expressing the permeability of the sleeve, and, according to the invention, should preferably be at least 0.95 (95 wt%). In many cases the two amounts of water are equal , viz. the sleeve behaves as if its permeability is 100 wt%. It will be appreciated that the same sleeve may have different permeabilities when applied to different drip pipelines, though generally it will have the same or nearly the same permeability with respect to any practical drip pipeline

Brief Description of the Drawings

In the drawings:

- Fig. 1 shows in perspective view two portions of pipe to each of which a spiral sleeve or spring has been applied;
- Fig. 2 is a vertical elevational view of a section of pipe to which a spiral sleeve or spring has been applied, the pipe being cut at the end of the spiral;
- Fig. 3 is a perspective view of a section of pipe having bores therein and a spiral sleeve that leaves one bore visible, the pipe not being in the position in which it is operative, but being slanted so to show the said one bore;
- Fig. 4 is a schematic axial cross-section of an embodiment of spiral sleeve; and
- Fig. 5 is a schematic cross-section of a pipe to which a metal spiral sleeve has been applied.

Detailed Description of Preferred Embodiments

With reference to Fig. 1, numerals 10 and 11 designate two segments of pipe for drip irrigation. Metal spiral sleeves 12 and 13 respectively are placed over said segments of pipe to cover the drip bores which are not visible.

Fig. 2 shows a similar pipe 15 in vertical elevational view. A spiral sleeve 16 is placed over said pipe 15.

In Fig. 3, a pipe 20 has bores 21 one of whch is visible in the figure. A spiral sleeve 22 is placed over the pipe, leaving said visible bore

uncovered. The pipe is seen at such an angle that the said bore 21 is visible, while in the operative position of the pipe it would be at the bottom of said pipe, viz. the pipe is at an angle of 90° from it operative position. In other words, the pipe cross-section that contains the centers of the bores is vertical in the operative position of the pipe, but in Fig. 3 it is horizontal.

Fig. 4 schematically shows a longitudinal cross-section of metal spiral sleeve or spring, generally indicated at 25 and formed by a metal wire 26. 27 indicates the spacing between adjacent spiral turns.

Fig. 5 schematically shows a longitudinal cross-section of a pipe 30, over which is placed a metal spiral sleeve 35. Pipe 30 is provided with bores, three of which are shown at 36.

Examples of drip pipelines that can be improved by this invention comprise pipelines having sections of length up to 500 meters, inner diameter from 4 to 25 cm, wall thickness from 100 to 1200 microns, and made from a metal or a plastic matter such as polypropylene. Bores are formed in the pipeline, e.g. by drilling or otherwise, in the number of from 1 to 10 per meter of length. The spiral sleeve used to cover said pipeline is made, for example, of a stainless steel 316 having a diameter of 1.2 mm. The sleeve has a spacing between adjacent spiral turns of 1 mm. Its permeability, measured as hereinbefore described, is between 95 and 100 wt%.

While embodiments of the invention have been described by way of illustration, it will be apparent that the invention may be carried out with many modifications, variations and adaptations, without departing from its spirit or exceeding the scope of the claims.

CLAIMS

1. Improved drip pipelines, comprising a layer pervious to water that is laid over the said bores provided therein at least over the bores through which liquid is dispensed to the soil.

2. Pipelines according to claim 1, wherein the layer pervious to water is a metal spiral sleeve.

3. Pipelines according to claim 2, wherein the sleeve is wound at least over the surface of the segments of the pipeline wherein a bore or bores have been formed.

4. Pipelines according to claim 2, wherein the sleeve is made of a metal wife resistant to the environment, wound in spiral form.

5. Pipelines according to claim 2, wherein the sleeve has a permeability to water of at least 95 wt%

6. Pipelines according to claim 2, wherein the sleeve consists of a stainless steel wire, having a diameter from 1 to 1.5 mm.

7. Pipelines according to claim 5, comprising pipes having sections of length up to 500 meters, inner diameter from 4 to 25 cm, wall thickness from 100 to 1200 microns, bores drilled therein in the number of from 1 to 10 per meter of length.

9. Method of protection of already laid drip pipelines, which comprises juxtaposing to each of a number of pipe sections a metalsleeve.

10. Improved drip pipelines, substantially as described and illustrated.

11. Method of making an improved drip pipeline, substantially as described and illustrated.

לוצאטו את לוצאטו
LUZZATTO & LUZZATTO
By עו"ד

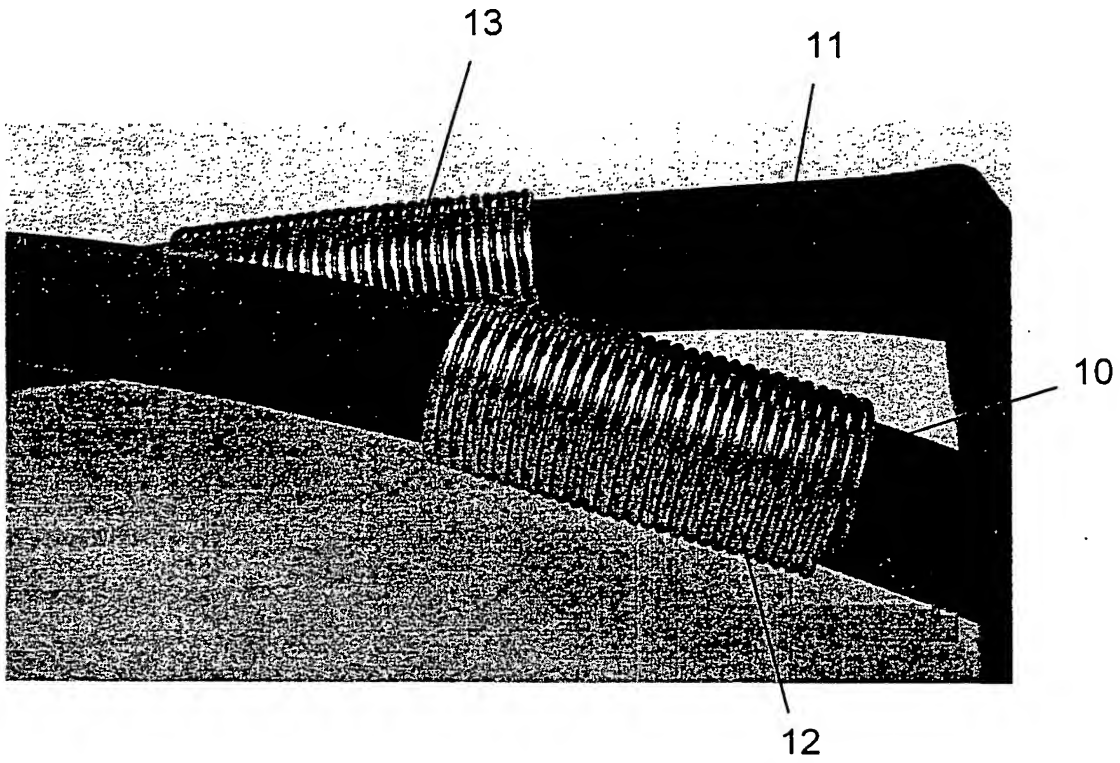

Fig. 1

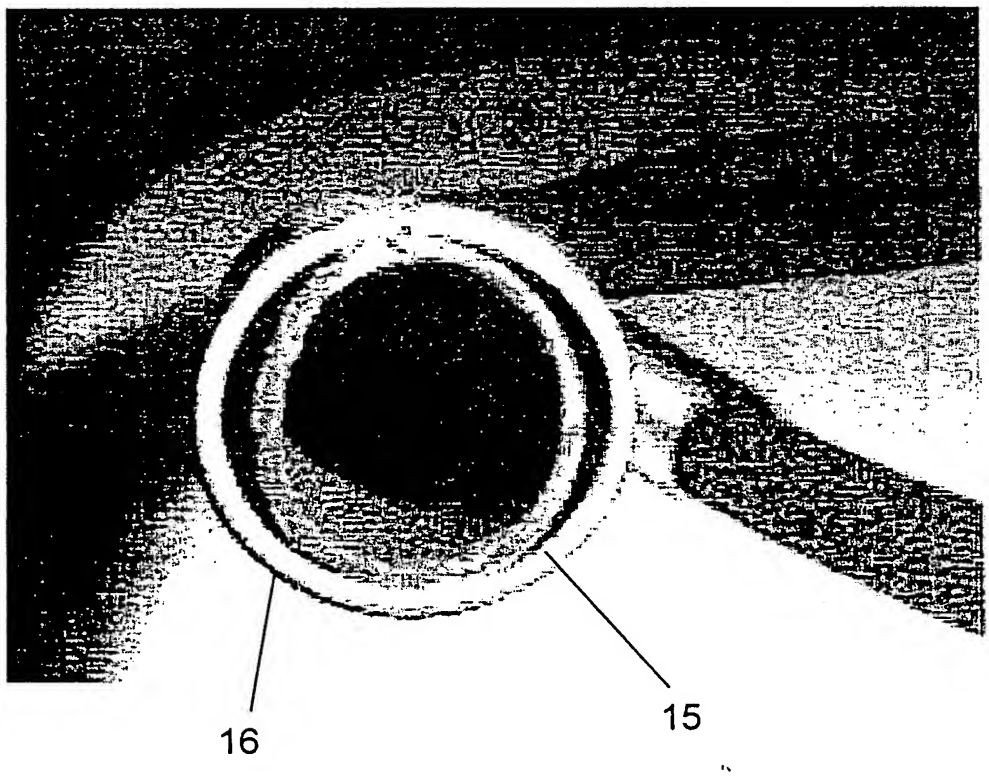

Fig. 2

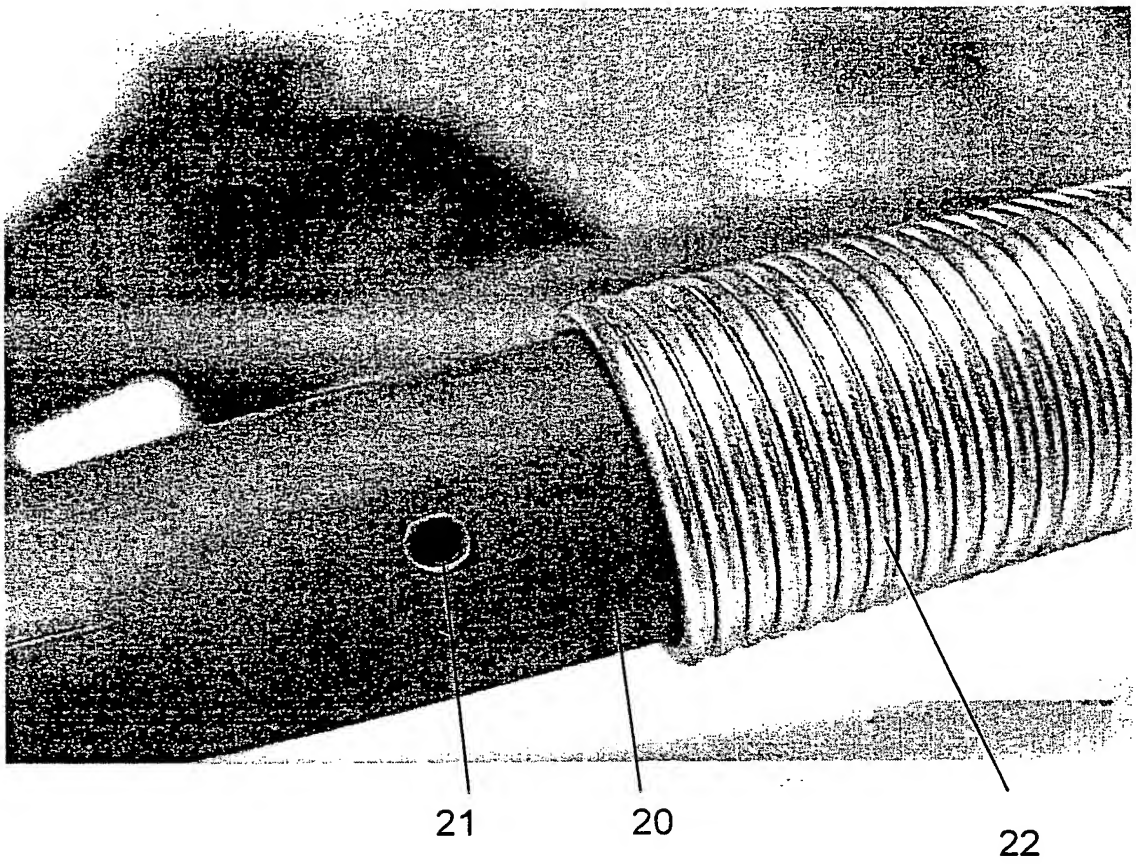

Fig. 3

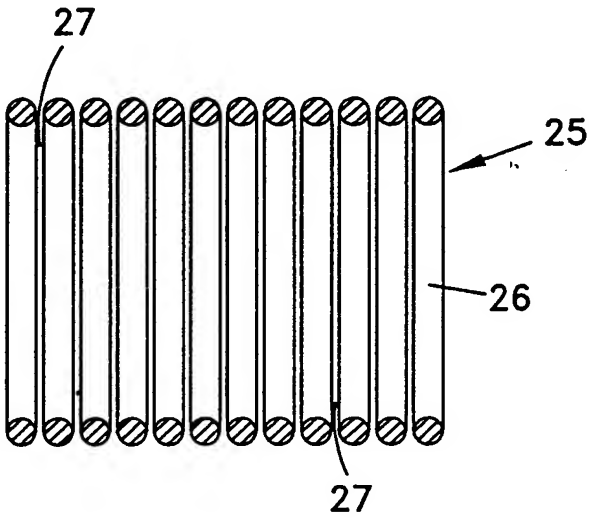

Fig. 4

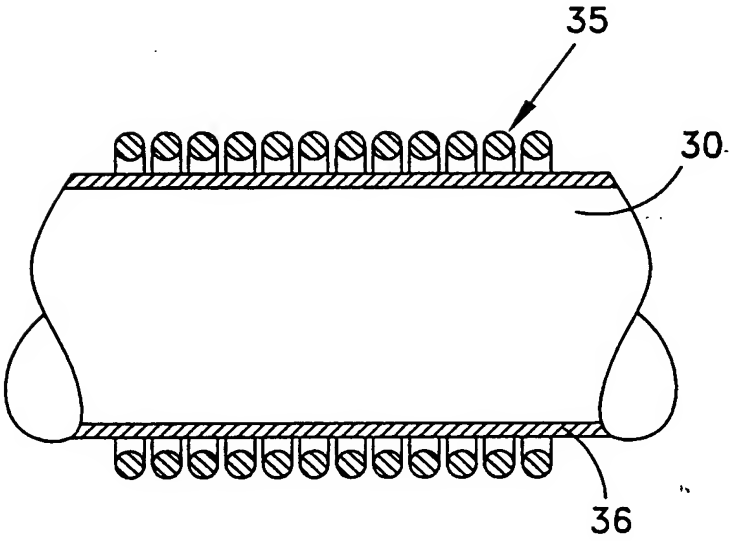

Fig. 5